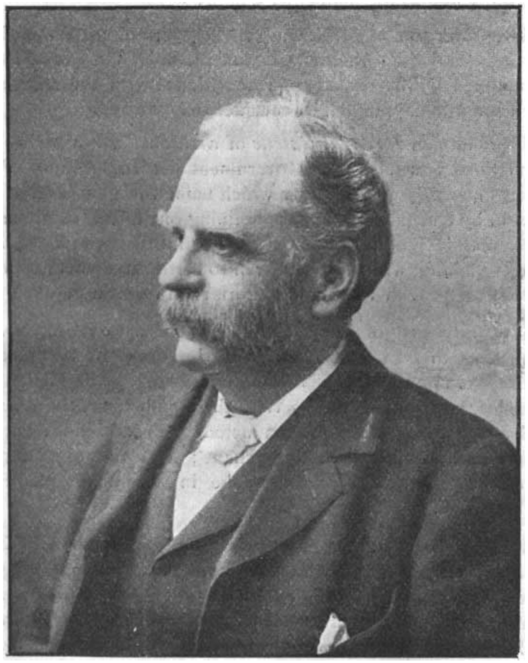
THE "CHALLENGER" ALBUM.

AT the Ipswich meeting of the British Association, a couple of years ago, a movement was started amongst the zoologists present to congratulate Dr. John Murray, and offer him some memorial of their appreciation of his services to science, on the completion of his editorial work in connection with the fifty volumes of the *Challenger* Reports. A Committee was formed, with Mr. W. E. Hoyle as Secretary, and the offering eventually took the appropriate form of a handsome album containing the portraits and signatures of the contributors to the *Challenger* Series, with an artistic cover and illustrated dedication designed by Mr. Walter Crane. The presentation was made to Dr. Murray at a meeting held in London on November 30, and the happy thought then occurred to Mr. Hoyle to have the volume, cover, dedication and photographs reproduced, so that all contributors, and some others, might have, if they desired, a copy of this interesting memorial of the completion of the *Challenger* work. The result is now before us in the form of a thin quarto volume, bound in dark green cloth like the *Challenger* Series, and containing some twenty sheets of portraits, along with reproductions of all Mr. Crane's quaint drawings, and an explanatory introduction drawn up by Mr. Hoyle. Messrs. Dulau and Co. have issued an edition of two hundred copies at 12*s.* 6*d.* each. Most of these are being secured by the contributors, but some copies can be obtained by libraries and individuals who desire to add this supplemental volume to their *Challenger* Series. Some of the original photographs were very good, others were poor, and naturally some of the reproductions are better than others; but all the portraits must be of considerable interest to those who possess, and to those who read the *Challenger* monographs. The volume is similar in size and style to the well-known Reports, and containing as it does portraits of all the eighty-eight contributors to the *Challenger* work, the pity is that there are not enough copies to go round all the libraries that contain the *Challenger* Series. We are enabled to show here the portrait of Dr. Murray himself.



John Murray.

NOTES.

THE Sydney expedition to Funafuti, to make borings in the coral, projected and led by Prof. David, started on June 2, going by steamer to Fiji, and thence by sailing vessel to Funafuti. This expedition has been made possible by the liberality of the Mining Department of the Government of New South Wales, which has supplied all the boring plant free of cost, and by the munificent gift from Miss Walker, of Sydney, of 500*l.*, and from the Hon. Ralph Abercrombie of 100*l.* towards the expenses of the expedition.

PROF. SOUILLARD, of Lille, has been elected a corresponding member of the Paris Academy of Sciences.

THE following are the names of the presidents of the several sections of the Australasian Association, the next session of which will be opened on January 6, 1898, under the presidency of Prof. Liversidge, the president-elect:—Section A—Astronomy, Mathematics and Physics, R. L. J. Ellery. Section B—Chemistry, T. C. Cloud. Section C—Geology and Mineralogy, Captain F. W. Hutton. Section D—Biology, Prof. T. J. Parker. Section E—Geography (president to be appointed). Section F—Ethnology and Anthropology, A. W. Howitt. Section G—Economic Science and Agriculture, R. M. Johnson. Section H—Engineering and Architecture, H. C. Stanley. Section I—Sanitary Science and Hygiene, Hon. Allan Campbell. Section J—Mental Science and Education, John Shirley.

THE third annual meeting of the Botanical Society of America will be held in Toronto on August 17 and 18, under the presidency of Dr. J. M. Coulter. The address of the retiring President, Dr. C. E. Bessey, will be given on the evening of the opening day.

THE summer meeting of the Institution of Mechanical Engineers will open at Birmingham on Tuesday, July 27. On the morning of that day there will be a reception by the Lord Mayor in the Examination Hall of the Municipal Technical School. The papers to be read and discussed deal with "Some Points of Cycle Construction," by Mr. F. J. Osmond; "The Birmingham Corporation Waterworks," by Mr. Henry Davey; "High Speed Self-lubricating Steam Engines," by Mr. Alfred Morcom; "Mechanical Features of Electric Traction," by Mr. Philip Dawson; and "Diagram Accounts for Engineering Work," by Mr. John Jameson. A large number of works in Birmingham, Wolverhampton, Oldbury, Tipton, Walsall, and Coventry will be thrown open for the inspection of members. On Wednesday the excursions will be to Wolverhampton district, on Thursday to Stratford-on-Avon and Walsall, and on Friday to Coventry, Warwick, and Rugby.

THE Paris correspondent of the *Times* reports that at the meeting of the Institute of France on July 7, the chief business of the sitting was the consideration of the bequest made to the Institute by the late Duc d'Aumale of his estate of Chantilly and the discussion as to whether the conservators of the château and grounds should be appointed for life or for three years only. By 58 votes to 53 the Institute decided that the appointment should be for three years, and M. Mézières, of the French Academy, M. Gruyer, of the Academy of Fine Arts, and M. Léopold Delisle, of the Academy of Inscriptions and Belles Lettres, were almost unanimously chosen as conservators for the next three years. The conservators of the new "Condé

Museum" are to receive an annual stipend of 3000f. and to be lodged at Chantilly. The financial administration of the estate will not, however, devolve upon them, but upon three other members of the Institute to be subsequently appointed. Later information has been received saying that M. Limbourg has been appointed Administrator-General of Chantilly.

WE regret to notice the death of Prof. W. Marmé, Director of the Pharmacological Institute of Göttingen; Dr. Giuseppe Fissore, formerly Professor of Pathology in the University of Turin; Dr. E. Legros, Professor of Physiology in the new University of Brussels; and Dr. Maréchal, formerly Professor in the Naval Medical School of Brest. The last-named died of septic poisoning.

MR. R. D. OLDHAM, the Acting Director of the Geological Survey of India, has sent to a correspondent a letter on the recent earthquake in Calcutta, from which we have been permitted to make the following extracts:—"I was at Naini Tal at the time, and as soon as I knew how bad it was, came down here [Calcutta] to make arrangements for a thorough investigation of it. At present it is not possible to say more than that it is the biggest and most severe of which there is any record in India, and that its investigation will be attended by considerable difficulty and inconvenience, not to say hardships, to the men employed, owing to the rainy season having commenced immediately after the earthquake. I have had orders from Government to prepare a full and detailed scientific report in the Geological Survey Department; have issued circulars to all station masters, telegraph officers, and other people likely to be able to give information, and have despatched every available man to investigate the damage done at all accessible places. Some that would have been worth visiting are, unfortunately, inaccessible at this season of the year."

IN addition to the foregoing communication we have received a lengthy letter on the subject, and a photograph, from Mr. T. D. La Touche; and these we hope to publish in a subsequent issue.

A DINNER was held on the 7th inst., under the presidency of the Duke of Cambridge, to commemorate the twenty-first anniversary of the formation of the Sanitary Institute. Speeches were delivered by Lord Kelvin, Sir Douglas Galton, Prof. Corfield, and others.

The American Naturalist notes that Dr. W. H. Evans, of Washington, D.C,, has gone to Alaska for several months to investigate the agricultural resources and possibilities of that portion of the territory lying south of the Aleutian peninsula. He will report to Congress as to the advisability of establishing experiment stations there. Dr. Sheldon Jackson is to collect similar information regarding the Yukon Basin.—Prof. Nelson, the University of Wyoming botanist, will make an excursion into the Red Sea Desert. This tract of land has, so far, never received a botanical investigation, and the Professor has planned to make three other trips into the desert during the summer. He expects to obtain many rare botanical specimens.—Prof. Bruner, of the University of Nebraska, has sailed for Buenos Ayres, where he will spend a year investigating the injurious locusts which have, of late, increased enormously in three of the eastern provinces of the Argentine Republic.

WE learn from the *Journal of Botany* that Mr. George Murray and Mr. V. H. Blackman have sailed for the West Indies, in order to work at the plant-plankton of the Atlantic, especially the forms found remote from coastal waters, such as the coccospheres and rhabdospheres. Their method of capture is by pumping sea-water through very fine silk bags, thus attaining practically the same result as by the tow-net, and without stopping the ship.

ACCORDING to *Science*, Major Powell is at present on the coast of Maine, engaged in research concerning shell mounds, in the interest of the Bureau of American Ethnology.

A MEETING was recently held in Glasgow, on the initiative of the Lord Provost, the Principal of the University, and the President of the Faculty of Physicians and Surgeons, to further the proposal to establish a memorial to William and John Hunter, and an executive committee was appointed to collect subscriptions; it is hoped that from 3000*l*. to 4000*l* may be raised.

THE Berlin Town Council, on the motion of Prof. Virchow, has decided to appoint a municipal "hydrologist," for the constant examination and hygienic supervision of the different Berlin waterworks. In connection with this appointment, the creation of a municipal board of health for the city of Berlin is being much discussed. If such were established, the municipal hospitals, orphanages, and asylums would be placed under its control, and also the municipal schools.

THE Park Board of New York City has adopted the plans for the buildings of the new Botanical Gardens in Bronx Park, as modified by the directors in accordance with the advice of the committee appointed to consider the question.

THE German *Imperial Gazette* of a recent date contains the regulations issued by the Government for the sale of Prof. Koch's new tuberculin, under which name the new specific will be sold by chemists in phials containing one millilitre at marks 8.50, and in phials containing five millilitres at marks 42.50. The tuberculin will only be given to certificated medical men, or to those provided with an authorisation from such.

THE July part of the *Journal of Anatomy and Physiology* announces that in consequence of the death of Sir George Murray Humphry, it has been considered advisable to reorganise the editorial staff. With the October part the *Journal* will, as regards anatomy, be conducted by Profs. Sir W. Turner, MacAlister, Cunningham and Thane; and the physiological department will, as heretofore, be in the hands of Prof. M'Kendrick.

IN our issue for June 24 we briefly described the run of the *Turbinia* from the Tyne to the Solent. We understand that during the three weeks the *Turbinia* was in the Solent she made frequent runs of many miles at a time, at speeds of from 30 to 35 knots, and that her performances were witnessed by many leading authorities in naval matters, as well as the mercantile marine. On Tuesday, June 29, with a distinguished company on board, she was run up to nearly full power, and maintained the unprecedented speed of 35 knots, or over 40 miles per hour, for the length of the line of battle-ships, or about 5 miles. During this run there was an absence of strain, and from this fact it seems that the limit of speed in this little vessel has not yet been reached, and that after further improvements, at present in progress (having returned to the Tyne last week), she will be capable of not only maintaining her position as much the fastest vessel afloat, but will be able to give many knots to any competitor engined with reciprocating engines. We purpose, in a subsequent issue, to give a further account of the compound turbine engines which, by the most direct and economical conversion of the power of the steam into effective horse-power in engines of unprecedently small weight, enable the *Turbinia* to achieve without stress or vibration such remarkable results.

THE Pilot Chart of the North Atlantic Ocean for July, issued by the American Hydrographic Office, contains a supplementary chart showing the tracks of floating bottles which have been returned to that office during a year ending June 1 last. Of the bottles recovered, eighty-one were thrown overboard in the North Atlantic, and these are the only ones dealt with upon the chart in question. Taken collectively, the courses followed by the bottles elucidate the main principles of oceanic circulation, and show the close agreement that exists between the motion of the surface water and the direction of the prevailing winds. Dividing the list into groups, according to latitude, and dealing only with those bottles whose drifts exceed 300 miles, we have the following average velocities of the daily drift:—North of 50°, 5·3 miles; between 40° and 50°, 5·3 miles; between 20° and 40°, 5 miles; between 0° and 20°, 9·8 miles. A noteworthy drift shown on the chart, is that of a bottle thrown overboard in lat. 2° 9′ S., long. 30° 25′ W., and picked up on the African coast, at the mouth of the Bathurst River. This bottle, set adrift in the strong south equatorial current, must have been transferred to the Guinea current, and carried by it to the exceptionally northern position at which it was recovered.

THE Director of the National Observatory at Athens (M. Eginitis), has made an important contribution to the meteorology of Southern Europe by the publication of a careful discussion of the observations at Athens during the present century, and now continued at the Observatory. Although there are several interruptions in the continuity of the earlier observations, they have been carried on regularly during the last thirty-seven years. The discussion, which extends to 220 large quarto pages, contains an exhaustive account of the climate, each element being separately treated, and, in addition to the instrumental observations, notice is taken of all information obtainable from the most ancient periods. The absolute extremes of temperature vary from 105·3° to 19·6°, giving a range of 85·7°. Rain falls, on an average, during ninety-eight days in the year, the normal annual amount being 16 inches. Athens enjoys a large amount of sunshine, the values recorded by a Campbell instrument in 1894 amounted to 2527 hours; at Eastbourne in the same year the amount registered by a similar instrument was 1669 hours. In some years the sun shines incessantly from morning till evening, for a month at a time.

THAT birds play an important part in relation to agriculture has long been known to ornithologists; but farmers have a tendency to dwell upon the harm they do, rather than the benefits received. A better feeling is, however, being cultivated by means of the publications of the Society for the Protection of Birds, by County Councils, and by a host of books on birds; so that the hope may be cherished that agriculturists will soon be able to discriminate between their feathered friends and foes. In the United States, serviceable knowledge of this character is communicated to all who are concerned with it. For instance, in the *Farmers' Bulletin* (No. 54), which has just been issued by the U.S. Department of Agriculture, Mr. F. E. L. Beal describes "Some Common Birds in their Relation to Agriculture." The *Bulletin* contains short accounts of the results of food studies of about thirty grain and insect eating birds belonging to the different families. It is pointed out that the value of birds in controlling insect pests should be more generally recognised; for while it may be an easy matter to exterminate the birds in an orchard or cornfield, it is an extremely difficult one to control the insect pests. How very valuable birds are, is illustrated by the fact that during the recent plague of Rocky Mountain locusts in the Western States, it was found that locusts were eaten by nearly every bird in the region, and that they formed almost the entire food of a large majority of this species. In winter sparrows are active weed destroyers, weed seed forming an important item of the winter food of many of these birds.

THE uncertainty which attaches to the specific-heat-ratio of gases as a means of distinguishing between monatomic and polyatomic molecules renders it of great interest to investigate other properties dependent on the molecular volume or cross-section. In the *Proceedings* of the American Academy of Arts and Sciences, xxxii. 11, Messrs. A. A. Noyes and H. M. Goodwin describe a new determination of the viscosity of mercury vapour and its comparison with those of hydrogen and carbon dioxide, the method used consisting in measuring the flux through a capillary tube under constant difference of pressure. By the application of O. E. Meyer's formula, the authors deduce that the cross-section of the mercury molecule or of its sphere of action is nearly the same as that of the carbon-dioxide molecule, and about two and a half times as large as that of the hydrogen molecule. Whether the authors are justified in their conclusion, "that atoms and molecules are of the same order of magnitude," depends on how far the value of the ratio of the specific heats in mercury is admitted to be indicative, on the kinetic theory, of the monatomic nature of that gas.

A NOTE has been communicated to the *Atti dei Lincei* by Dr. Emilio Oddone, on an apparatus for determining the thermal conductivity of substances which are bad conductors. The apparatus is based on the model of one constructed and described by Dr. Venske, of Göttingen, in 1891, and the author describes a determination made by it for glass. It is proposed to apply the method to the conductivity of rocks, and we hope that the investigations will throw fresh light on the past history of the earth.

IN a very suggestive, privately published, essay entitled "Demeter und Baubo, Versuch einer Theorie der Entstehung unsres Ackerbaus," E. Hahn puts forward a number of new views, and combats many old ones. He believes that man was primitively an omnivorous "collector," later he severally diverged into a hunter, a fisher or a planter, or in certain districts into a herder; but he denies the evolutionary series of hunter, herder and agriculturist. He argues that the first cultivated plant was millet, and he draws a sharp distinction between hoe-culture and the cultivation of cereals with the use of the plough, He believes barley was the earliest cereal, and wheat the latest. There is no necessary connection between our method of tillage with the plough (with the keeping of domestic animals), and the use of milk. Cattle were first domesticated as draught animals and to draw the plough, and it was only long afterwards that they were trained to yield milk for human food. The author is greatly impressed with the effect of religion on the progress of early culture; for example, he holds that the waggon was originally employed for the transport of effigies of the goddess of fertility, probably the moon, and that later it became a secular vehicle. He does not believe that wheels were evolved from rollers, but that they were derived from spindle-whorls, four of which were attached to a board, and so arose the diminutive and primitive conveyance of the goddess. The author invites criticism, and would be glad of references to researches bearing on his subject; these should be addressed to him, care of Max Schmidt, bookseller, Lübeck.

HERR F. R. FRIIS has just completed and published the correspondence between Tycho Brahe and Oligerus Rosenkrantz during the years 1596 and 1601. This book, which is entitled "Epistolæ quas per annos a 1596 ad 1601 Tycho Brahe et Oligerus Rosenkrantzius inter se dederunt," contains in its 80 pages twenty-four letters, most of which were written by Tycho Brahe *to* Rosenkrantz. In the appendix are given ten other interesting communications, written about the same time. The compiler of this collection is to be congratulated on the important service he is rendering history by this collection, which is a further addition to letters already published. The first publication was entitled "Tychonis Brahei et ad eum doctorum virorum Epistolæ ab anno 1568 ad annum 1587," and was accompanied "cum effigie Tychonis Brahei et exemplo ipsius manus." We may mention that only a small number has been printed, and those wishing to acquire copies can do so from the following address:—F. R. Friis, Copenhague, Cart Adelersgade 7.

THE report on the operations of the Department of Land Records and Agriculture, Madras Presidency, for the official year 1895-96, has just reached us, and is full of interest. The department, during the period under survey, appears to have been most active in the performance of its duties, and good work was carried on, or attempted under, in many instances, great disadvantages. The unfavourable character of the weather caused a failure in many of the planting experiments. Courses of lectures were delivered on the subjects of agricultural chemistry and veterinary science, and experiments were made with various kinds of ploughs in Kurnool district. Inquiries were made "as to whether any animal or vegetable parasites have been anywhere observed, or can be found feeding upon the prickly-pear in such a manner as to warrant a hope that it might be used as an agency for destroying the said plant," and the opinion arrived at, from the reports received, was that there are no parasites known in the Presidency which can be depended upon to destroy prickly-pear growth.

THE alleged reflexion of kathodic and Röntgen rays have been made the subject of two independent but closely-allied investigations by Prof. A. Battelli (*Nuovo Cimento*, v. 4) and M. P. Villard (*Bull. Société Française de Physique*, 95). Prof. Battelli's conclusions are as follows: (1) It cannot be asserted that kathodic rays are reflected according to the regular law; (2) rays coming from the speculum of a focus-tube have the same properties as direct kathodic rays; (3) the same properties are possessed by rays coming from the anterior face of a very thin lamina, on whose posterior face kathodic rays impinge; (4) a pencil of such rays seems to be constituted of different kinds of rays which, when they fall on a thin body, appear to traverse it in somewhat the same manner that they would traverse a filter which allowed some rays to pass through more freely than others. M. Villard finds that kathodic rays that have fallen on a thin metallic lamina, emerge in the form of a diffused pencil, whose general direction is normal to the lamina, but the phenomenon appears to be a kind of refraction. Reflexion is more easily obtained, and the phenomenon can be photographed: the reflected rays possess all the properties of kathodic rays, and are strongly deflected by the repulsive action of the kathode. Experiments show that this reflexion, though evidently anomalous, is perfectly definite.

DR. ITALO BOSI contributes to the *Nuovo Cimento*, 4, v. a series of observations on the electric resistance of solutions of salts in motion, which have an important bearing on Hittorff's and Arrhenius' theories of electrolysis. Dr. Bosi finds that in solutions where the effect of electrolysis is to produce greater concentration at the positive pole, the resistance increases when the liquid is moving in the opposite direction to the current, and decreases when it is moving in the same direction; but the increase in the first case is greater than the decrease in the second. Where the concentration is greater at the negative pole the effect is reversed; the increase of resistance, however, still exceeds the decrease. Finally, when electrolysis produces no difference of concentration at the two electrodes, the resistance is unaffected by the motion of the liquid. These conclusions do not entirely accord with the hypotheses either of Hittorff or of Arrhenius. An investigation somewhat allied to the present had previously been made by Edlund, but this was rather qualitative than quantitative in character, and, moreover, the fluids used by Edlund (town water, alcohol and water, and others) left some doubt as to the nature of the dissolved salts contained in them.

THE *American Naturalist* for June contains an account, by Mr. G. C. Whipple, of the biological laboratory instituted by the Boston Water Works for the examination of the purity of the water supplied to that city. The object of the laboratory work is to ascertain and keep a record of the condition of the water in all parts of the supply at the same time. The microscopical work consists chiefly in the quantitative determination of the various microscopic organisms, except bacteria, in each sample of water, by the Sedgwick-Rafter method. In addition to this, the number of bacteria is determined in the water of all the reservoirs, aqueducts, and service-pipes, and a careful watch is kept for those of a pathogenous character. It is stated that the work done in this and in other similar biological laboratories in Massachusetts (there is a separate one for the city of Lynn) has been of great value, both from a purely scientific and from a sanitary point of view, and that by these investigations the supply of inferior water has several times been prevented.

IN "Minnesota Botanical Studies" (*Bulletin* No. 9, Parts x. and xi.), published by the Geological and Natural History Survey of Minnesota, are several papers of more than local interest. Mr. J. M. Holzinger calls attention to some mosses found by him at high altitudes. On Pike's Peak, Colorado, between altitudes of 12,502 feet and the top of the peak (14,147 feet), he collected thirty species of mosses which deserve attention. Mr. R. N. Day contributes a paper on the relative value of various forces operative in the production of the positions of dorsiventral leaves. He concludes that light cannot induce epinasty or hyponasty, and adds: "This is in direct support of the position taken by Vines, and the results upon which it is based demonstrate that the photo-epinasty of Detmer does not exist as such." Mr. A. A. Heller gives a valuable description of the ferns and flowering plants of the Hawaiian Islands; and the phenomena of symbiosis is the subject of a paper by Mr. Albert Schneider. Mr. Conway MacMillan, State Botanist of Minnesota, discusses his observations of the distribution of plants along the shores of the Lake of the Woods, the purpose of his paper being to point out the dependence of plant formations over such an area as the shores of the lake upon topographic and environmental conditions. It is shown how each formation may be explained briefly as connected with a certain *mélange* of outward conditions, and an effort is made to analyse these conditions both by themselves and as connected with the growth of vegetation.

THE first part of an "Essai sur les éléments de la mécanique des particules," by M. H. Majlert, has been received from MM. Gauthier-Villars et Fils, Paris. The object of the work is to bring forward some new geometrical views on problems of hydrodynamics. In the present part, entitled "Statique particulaire," the author deals with general principles referring to matter and energy, atoms and molecules, states of aggregation of simple bodies, chemical combinations, and co-related subjects. He reserves for a second part, to be published under the subtitle "Dynamique particulaire," the results of his special studies on energy and its manifestations; and we reserve our review of the work until that part appears.

THE fourth number of *Archives of Skiagraphy*, edited by Mr. Sydney Rowland, has just been published. Among the subjects and objects illustrated upon the six collotype plates are the dislocation of an elbow, fracture of radius and ulna, the lobster, edible crab, hermit crab, and five of Dr. Macintyre's Röntgen photographs of a frog's leg in movement.

SEVERAL articles on subjects of scientific interest appear in the July magazines. Mrs. Percy Frankland gives in *Longman's Magazine* an outline of the rise and development of bacteriology during the past sixty years; and to *Good Words* she contributes a sketch of the career of the great leader of bacteriological science, Pasteur. The Zoological Gardens at Amsterdam are described in *Macmillan's Magazine* by Mr. C. J. Cornish; and Mr. H. W. Seton-Karr narrates in the *Century* his hunting experiences in Africa and India, referring incidentally to his discovery of palæolithic flint implements in Somaliland. An interesting account of the discovery of the American continent by the Cabots, illustrated from original documents, autograph letters and ancient maps, is contributed to *Scribner's Magazine* by the Marquis of Dufferin.

THE Department of Agriculture, Brisbane, Queensland, has recently issued the second edition of "A Companion for the Queensland Student of Plant Life, and Botany Abridged," by Mr. F. M. Bailey, the Colonial Botanist. Many of the notes are given with a view to assist school teachers, and particularly those residing in the country districts, to some of the more prominent distinctive characteristics of common plants. We notice that copies of the pamphlet can be obtained free by persons interested, on application to the Under-Secretary for Agriculture, Brisbane.—A translation, by C. S. Fox, of the official "Guide to the Royal Collections of Dresden," comes to us from Albanus, of Dresden. In it will be found very full information as to the collections housed in the Museum (Zwinger), the Royal Palace, the Johanneum Museum, the Albertinum, and the Japanese Palace. It remains to be said that the Guide is very well got up.—The third report of the Commissioners of the Whitechapel Public Library and Museum has reached us, and contains much interesting matter. Science is not overlooked in Whitechapel, as the list of sixteen lectures by well-known men of science shows. The library contains, in its lending branch, 541 books dealing with natural science, and in works relating to voyages and travels 614 books. In the reference department natural science is represented by 444 works, and voyages and travels by 89. We are sorry to see that there was a falling-off in the number of readers of books dealing with the subjects mentioned, as compared with the numbers given in the preceding report.

AMONG official American publications relating to botanical and agricultural science recently received, are the following:—Twentieth Annual Report of the Connecticut Agricultural Experiment Station for 1896, chiefly devoted to the properties and analysis of fertilising manures; Studies on American Grasses, being Bulletin No. 8 of the U.S. Department of Agriculture, Division of Agrostology (New or little-known Grasses, by F. Lawson-Scribner; Leaf-structure of *Jouvea* and of *Eragrostis obtusiflora*, by Miss E. L. Ogden); Bulletins Nos. 141–144 of the Michigan State Agricultural College Experiment Station (Forage crops and Wheat; Small fruit trials at the College; Fruit tests at South Haven; Vegetables, old and new).

THE additions to the Zoological Society's Gardens during the past week include a Syrian Bear (*Ursus syriacus*, ♀) from the hills north of Bagdad, presented by Mr. B. T. Ffinch; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Mr. J. B. Gowing; an Osprey (*Pandion haliætus*) from Aberdeenshire, presented by Major-General Russell, M.P.; a Cayman-Island Amazon (*Chrysotis caymanensis*) from the Cayman Islands, presented by Mr. C. Home Sinclair; a Blue-fronted Amazon (*Chrysotis æstiva*) from South America, presented by Mrs. Reynell; a Shag (*Phalacrocorax graculus*) British, presented by Mr. Edward Step; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, presented by Miss Amy Meyer; a European Tree Frog (*Hyla aborea*) from Southern Europe, presented by Mrs. Nicolas Wood; a Bonnet Monkey (albino) (*Macacus sinicus*, ♂) from India, a Rock-hopper Penguin (*Eudyptes chrysocome*) from the Antipodes Islands, a Thick-billed Penguin (*Eudyptes pachyrhynchus*) from the Stewart Islands, a Graceful Ground Dove (*Geopelia cuneata*), two Ganga Cockatoos (*Callocephalon galeatum*) from Australia, deposited; a Dwarf Finch (*Spermestes nana*) from Madagascar, two Barred-shouldered Doves (*Geopelia humeralis*) from Australia, two Chinese Turtle Doves (*Turtur chinensis*) from India, purchased; an English Wild Bull (*Bos taurus*), two Common Blue-Birds (*Sialia wilsoni*), four White-backed Pigeons (*Columba leuconota*), two Triangular-spotted Pigeons (*Columba guinea*), a Spotted Pigeon (*Columba maculosa*), a Crested Pigeon (*Ocyphaps lophotes*), an Auriculated Dove (*Zenaida auriculata*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

JUPITER'S SATELLITES.—In a previous note we referred to the period of rotation of the third satellite of Jupiter as determined by recent observations made by Mr. Douglass at the Lowell Observatory. In the current number of the *Astronomischen Nachrichten* (No. 3432) he communicates a more detailed description of the observations, together with reproductions of the surface markings, which led him to the determination of the length of the period of rotation. Attempts were at first made to discover signs of surface movement within three to five hours of continuous observation. None, however, could be detected, so that the 24-hour period had to be discarded as untenable. A large series of sketches showed that the satellite's period was nearly the same as its period of revolution, namely, 7d. 5·1h. ± 1·2h. The surface markings seem to take the form of lines, their maximum width being estimated at less than 0″·1, or 200 miles. The fourth satellite was also observed minutely, and on its surface were seen markings which are described as similar to those found on the third. Its period of rotation was also noted as being probably nearly equal to its period of revolution round its primary. Prof. W. H. Pickering's discovery of the variability in the elongation of the first satellite seems to be confirmed by Mr. Douglass, who found this satellite at the time of observation "most remarkably elongated."

THE CONSTANT OF ABERRATION.—Mr. C. L. Doolittle has recently concluded a discussion of several observations with the object of determining the value of the constant of aberration (*Astr. Journal*, No. 406). The series of observations used possessed some special advantages for such an investigation, since the stars were distributed very uniformly throughout the twenty-four hours of right ascension, and each group was observed both morning and evening at approximately the same interval before and after midnight. In all, 107 pairs of stars were used, the series extending from 1892 October 10 to 1893 December 27: these included 1744 determinations before, and 1052 determinations after midnight. The final value obtained, namely,

$$20''\cdot55 \pm 0\cdot01$$

seems rather high when compared with those obtained by other investigators. The following brief table brings together a few of the results previously determined.

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1843	Struve	20·445
1844	C. A. F. Peters	20·503
1849	,,	20·481
1850	Maclear	20·53
1861	Main	20·335
1882	Downing	20·378
1883	Nyrén	20·492
1888	Küstner	20·313
1895	Newcomb	20·511

CATALOGUE OF 480 STARS FOR ZONE OBSERVATIONS BETWEEN −20° AND −80°.—Ten years ago Prof. Auwers published a list in the *Monthly Notices* of 480 stars to serve as standards for zone observations. It was then suggested that these stars should be systematically observed at those observatories situated in southern latitudes. Sufficient material has, however, been obtained to enable Prof. Auwers to publish in the current number of the *Astronomischen Nachrichten* (No. 3431–32) a complete catalogue of the positions of these 480 stars, together with a selection of nineteen other southern fundamental stars. Prof. Auwers mentions, however, that we must not treat the